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RESEARCH ARTICLE

First record of *Denticollis borealis* (Paykull, 1800) (Coleoptera, Elateridae) from Kazakhstan

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Abstract

Denticollis borealis (Paykull, 1800) (Coleoptera: Elateridae) is recorded for the first time in Kazakhstan. Species was found in bracket fungus and under bark, in galleries of larvae of *Upis ceramboides* (Linnaeus, 1758) and *Sinodendron cylindricum* (Linnaeus, 1758). It is possible that the larvae of *D. borealis* are predators of the species of beetles in whose galleries it was found. A key to the known species of the genus *Denticollis* from Kazakhstan is also given.

Keywords

Click beetles, new findings, key, North and East Kazakhstan

Introduction

The genus *Denticollis* Piller & Mitterpacher, 1783 belongs to the family click beetles (Elateridae Leach, 1815) and includes 31 species (Medvedev 2005). The species of the genus are distributed in Eurasia, North and Central America. In the Palaearctic region the genus is comprised of 27 species (Medvedev 2005; Cate et al 2007; *Denticollis* Piller & Mitterpacher, 1783 in GBIF Secretariat 2023). *Denticollis* species inhabit forest biotopes. The larvae live in rotten wood, under bark and in soil, they

are predators and sapromycetophages. Pupation occurs in the second half of summer-early autumn. Adult beetles overwinter in soil cradles. Flight occurs from May to August. Imagoes are found on flowers of Rosacea, Apiacea, Salicacea and other plants. Only one species of the genus, *D. linearis* Linnaeus, 1758, was known from Kazakhstan to date (Cherepanov 1957; Gurjeva 1965, 1989; Dolin 1978; Nikitsky 1980; Medvedev 2005; Ormanova 2024). As a result of the research, one species of this genus *Denticollis*, are determinates as new for Kazakhstan.

Denticollis borealis (Paykull, 1800) has not been previously detected in Kazakhstan. Species found in deciduous and mixed forests, groves, forest edges. This species inhabits and develops under moldy bark and in rotten wood, usually of deciduous trees, most often birch (*Betula* spp.), alder (*Alnus* spp.), willow (*Salix* spp.), oak (*Querqus* spp.), beech (*Fagus* spp.), elm (*Ulmus* spp.), Japanese walnut (*Juglans mandshurica* Maxim.) (Kompantseva and Mamaev 1982; Nikitsky et al. 1996). Adults occasionally found on the fruiting bodies of some xylotrophic fungi, for example Willow bracket *Phellinus igniarius* (L.) Quél, and on flowers of *Salix eleagnos* Scop. The larvae live in rotten wood, fungus and forest soil; they are predator, saprophagous, necrophagous and facultative mycetophagous (Zaitzev 1915; Cherepanov 1957; Gurjeva 1965, 1989; Dolin 1978; Nikitsky 1980; Krasutsky 1996, 2005; Nikitsky et al. 1996; Medvedev 2005). The species is listed as an entomophage of the longhorn beetles *Necydalis maior* Linnaeus, 1758 and *Lepturalia nigripes* (De Geer, 1775) (Sláma 1998).

Materials and methods

The material was collected by manual collecting at 2025 in North Kazakhstan, Akmola oblast and East Kazakhstan, East-Kazakhstan oblast. Standard techniques (Fasulati 1971) were used during the collection of the material. The following sources (Jacobson 1905–1915; Zaitzev 1915; Cherepanov 1957; Gurjeva 1965, 1972, 1989; Dolin 1978; Nikitsky 1980; Kompantseva and Mamaev 1982; Gurjeva 1989; Krasutsky 1996, 2005; Nikitsky et al. 1996; Sláma 1998; Medvedev 2005; Cate et al. 2007; Cálix et al. 2018; Ljungberg et al. 2020; *Denticollis* Piller & Mitterpacher, 1783 in GBIF Secretariat 2023; Ormanova 2024) were used for identification of the species, data on its biology and the distribution. Studied specimens are kept in the private collection of I.I. Temreshev (Almaty, Kazakhstan).

Photographs of *Denticollis borealis* were taken with a camera Canon EOS 50 D (Figs 1, 4). Photographs of the habitat were taken with a camera Honor X9c 8/256 Titanium Black (Fig. 3).

The fungus on which the material was collected were determined using special literature (Samgina 1981, 1985) and the materials from the site "Mushrooms of Kazakhstan", from http://fungi.su//infusions/advanced_articles_sort/fungi_cl.php).

The map was created using the Simple Mappr program (Shorthouse 2010) and the sources indicated above.

The abbreviations used in the text: ex. – exemplar, nei. - neighborhoods.

Results

Family Elateridae Leach, 1815

Genus *Denticollis* Piller & Mitterpacher, 1783

***Denticollis borealis* (Paykull, 1800)**
= *Elater borealis* Paykull, 1800
Fig. 1

Material examined. 2 ex. adults – 2.09.2025, North Kazakhstan, Akmola oblast, Zerendi district, nei. of Vasilkovka village, pine-birch forest, 53°27'16.06" N 69°21'34.94" E, under bark of dead European white birch *Betula pendula* Roth. with Violet-toothed polypore *Trichaptum biforme* (Fr.) Ryvarden, 1972, in gallery of larva of Roughened darkling beetle *Upis ceramboides* (Linnaeus, 1758), I.I. Temreshev; 3 ex. adults, 2 ex. larva – 6.09.2025, North Kazakhstan, Akmola oblast, Zerendi district, nei. of Dongylagash village, birch forest, 53°26'58.56" N 69°7'5.28" E, in Lumpy bracket *Trametes gibbosa* (Pers.) Fr. and Tinder bracket *Fomes fomentarius* (L.) Fr., on dead European birch *Betula pendula* Roth, I.I. Temreshev; 1 ex. adults, 4 ex. larva – 3.10.2025, East Kazakhstan, East-Kazakhstan oblast, Altai district, nei. of Bobrovka village, mixed birch-aspen forest, 49°52'26.16"N 84°15'9.95"E, under bark of dead European white birch *Betula pendula* Roth. with Common porecrust *Schizophyllum commune* Fr., Hoof fungus *Fomes fomentarius* (L.) Fr. and Lacquered bracket *Ganoderma lucidum* (Curtis) P. Karst., in gallery of Rhinoceros stag beetle *Sinodendron cylindricum* (Linnaeus, 1758) (Figures 2–5).

Distribution. *Denticollis borealis* is distributed in Europe (Belarus, Czech, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Netherlands, Norway, Poland, Russia, Slovakia, Sweden, Ukraine), Asia (Far East, Mongolia, Siberia) (Jacobson 1905–1915; Gurjeva 1972, 1989; Krasutsky 1996, 2005; Cate et al. 2007;) (Fig. 6). This species is recorded for the first time in Kazakhstan.

Bionomics. *Denticollis borealis* has not previously been recorded in gallery of larva of *U. ceramboides*. The species was found also along with pleasing fungus beetles (Erotylidae): *Dacne bipustulata* (Thunberg, 1781), *Triplax russica* (Linnaeus, 1758), hairy fungus beetles (Mycetophagidae): *Mycetophagus quadripustulatus* (Linnaeus, 1761), cerylonid beetles (Cerylonidae) *Cerylon impressum* Erichson, 1845, darkling beetles (Tenebrionidae) *Corticeus bicolor* (Olivier, 1790) and *Neomida haemorrhoidalis* (Fabricius, 1787), ironclad beetles (Zopheridae) *Colobicus hirtus* (Rossi, 1790), and dry fungus beetles (Sphindidae) *Aspidiphorus orbiculatus* (Gyllenhal, 1808) (Temreshev 2019; 2022; 2023; 2024a, b; 2025a, b, c).

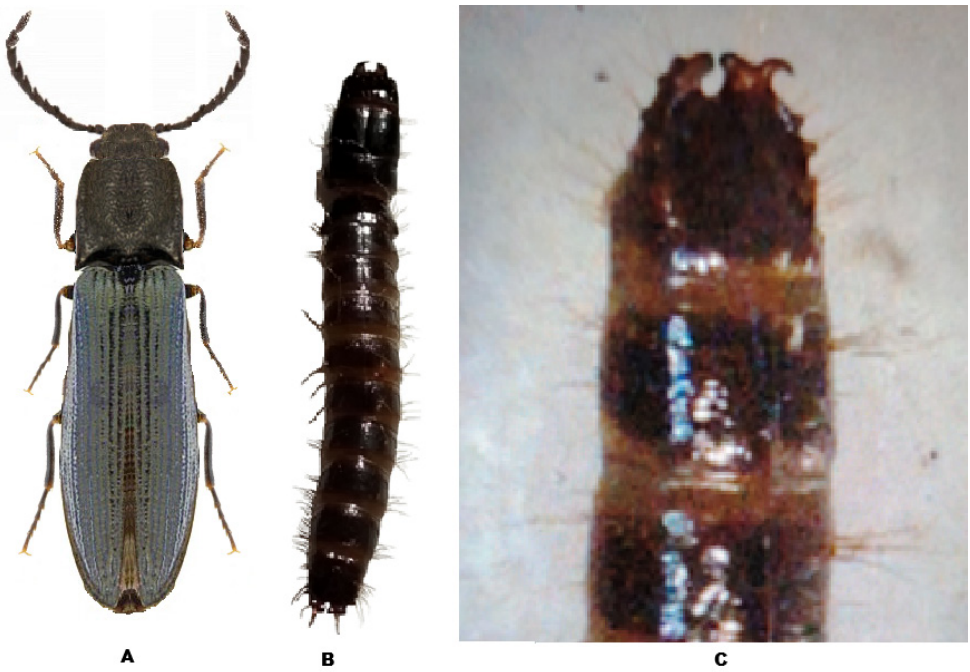

Figure 1. *Denticollis borealis*, habitus: **A** – adult, dorsal view, North Kazakhstan; **B** – larva, dorsal view, East Kazakhstan; **C** – last abdominal tergites of the larva, East Kazakhstan.

Discussion

In total, two species of click beetles from genus *Denticollis* are known for Kazakhstan at present.

Key to known species of the genus *Denticollis* from Kazakhstan

1 The whole body is completely black. Pronotum with a shallow groove in the middle; its posterior angles are directed backwards. Body length 10,0–12,0 mm. .....*D. borealis*

– The anterior margin of the forehead, pronotum and elytra are red or yellow in males; sometimes the elytra are black with a red border in females. Sometimes males have a black spot in the center of the pronotum. The pronotum has a deep groove in the middle and one oblique depression on either side of it; its posterior angles are bent to the sides in the form of hooks. Body length 9,5–12,5 mm.. .....*D. linearis*

Thus, *D. borealis* are recorded for the first time in Kazakhstan, based on the materials collected in the northern part of the country. Now two species of the genus (*D. borealis* and *D. linearis*) are known in Kazakhstan.

Figure 2. Living specimens of *Denticollis borealis*: **A** – adult in a gallery of larva of *Upis ceramboides*; **B** – adult in a *Trametes gibbosa*; **C** – larva in a gallery of larva of *Upis ceramboides*; **D** – larva in a gallery of larva of *Sinodendron cylindricum*. North and East Kazakhstan.

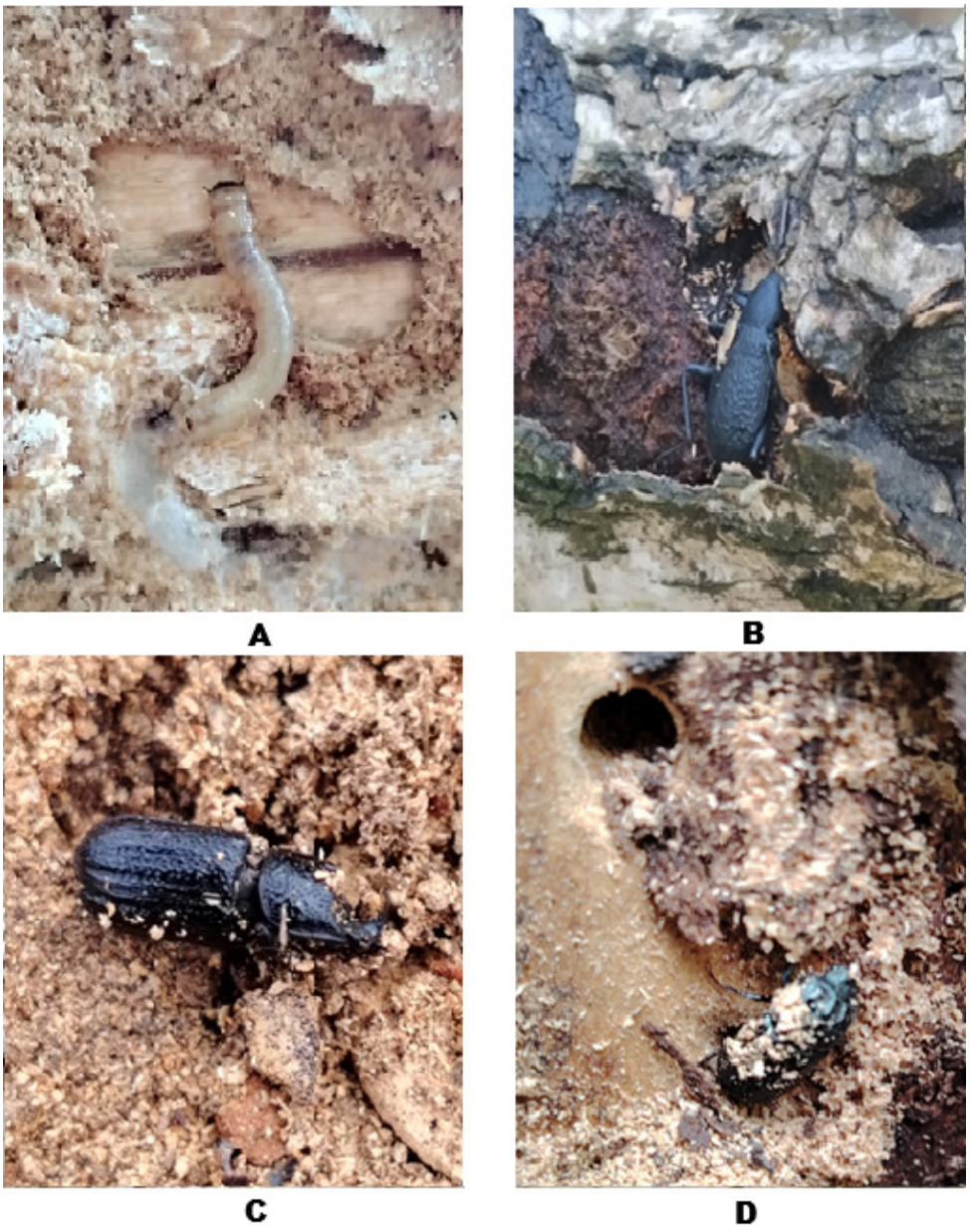

Figure 3. Saproxylic beetles in whose tunnels *Denticollis borealis* was found: **A** – larva of *Upis ceramboides*; **B** – adult of *Upis ceramboides*; **C** – male of *Sinodendron cylindricum*; **D** – female of *Sinodendron cylindricum*. North and East Kazakhstan.

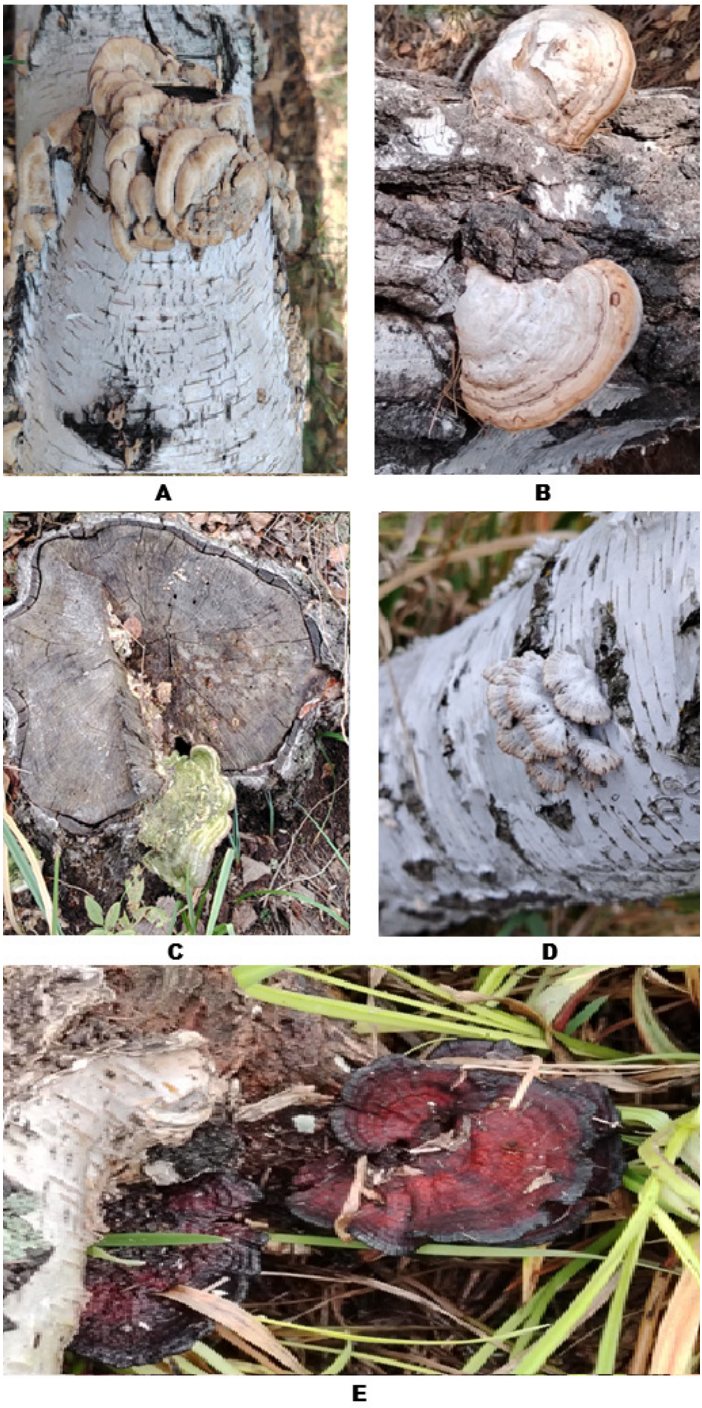

Figure 4. Fungus in which or near *Denticollis borealis* was found: **A** – *Trichaptum biforme*, North Kazakhstan; **B** – *Fomes fomentarius*, North Kazakhstan; **C** – *Trametes gibbosa*, North Kazakhstan; **D** – *Schizophyllum commune*, East Kazakhstan; **E** – *Ganoderma lucidum*, East Kazakhstan.

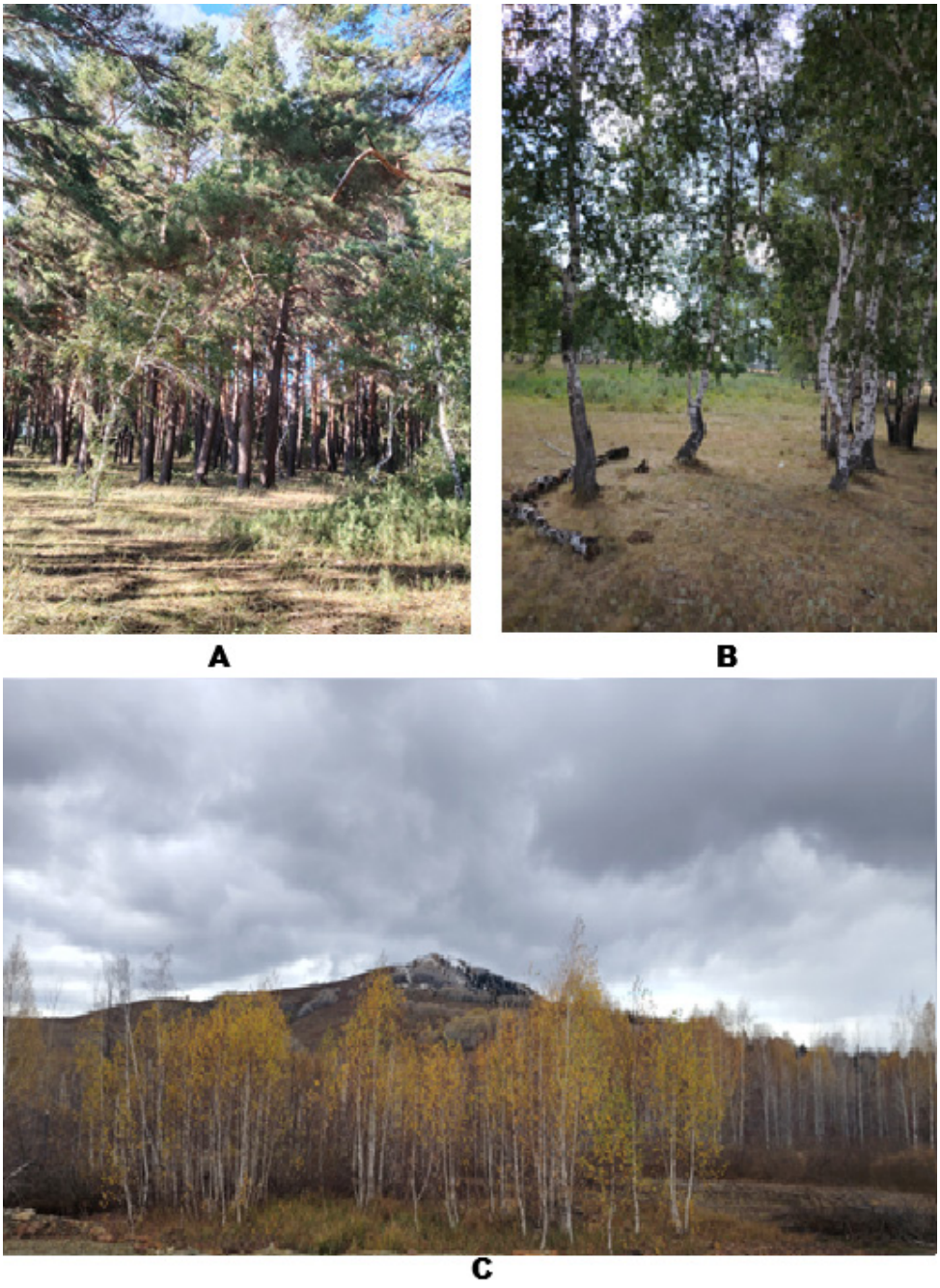

Figure 5. Habitats of *Denticollis borealis*: **A** – pine-birch forest, Akmola oblast, North Kazakhstan; **B** – European white birch grove, Akmola oblast, North Kazakhstan; **C** – mixed birch-aspen forest, East-Kazakhstan oblast, East Kazakhstan.

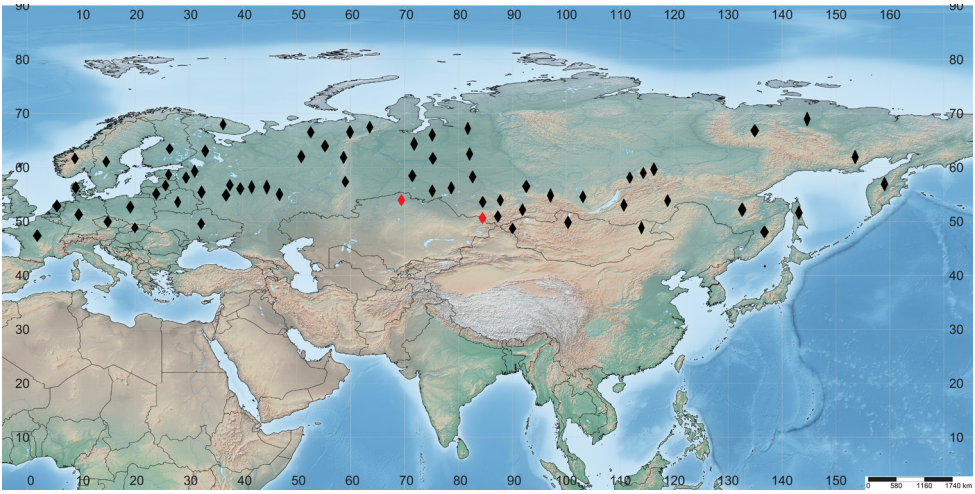

Figure 6. Known records of *Denticollis borealis* in world (black rhombus) and new records in Kazakhstan (red rhombus).

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